What is claimed is:

CLAIMS

~~1. A network element (NE) comprising;~~

a port for connection to another network element, the port configured to support at least one transport level overhead message;

means for determining whether the network element is a leader or non-leader NE; and

an out of band channel for communication with one or more network elements, the out of band channel configured to transmit a request for port identification and to receive a request for port identification, the port further configured to transmit a port detection signal in cooperation with the request for port identification transmitted through the out of band channel.

2. The NE of claim 1 wherein the out of band channel is configured to transmit the request for port identification to another NE if the NE is not a leader NE.

3. The NE of claim 1 further comprising a port identification request queue and wherein the NE is configured to place a request for port identification in the queue.

4. The NE of claim 3 wherein the NE is configured to accept port identification requests from other NEs and place them in the queue if the NE is a leader NE.

5. The NE of claim 4 wherein the NE is configured to place port identification requests it generates into the queue.

6. The NE of claim 2 wherein the out of band channel is configured to transmit the request for port identification to a leader NE.

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7. The NE of claim 1 wherein the NE is a SONET NE.

8. The NE of claim 1 wherein the NE is an SDH NE.

9. The NE of claim 1 wherein the NE is a packet switching NE.

10. The NE of claim 1 wherein the NE is an ATM NE.

11. The NE of claim 1 wherein the port detection signal is a SONET/SDH protection switching message.

12. The NE of claim 1 wherein the network element comprises a plurality of SONET/SDH ports and is responsive to the reception of a port detection signal by polling a plurality of ports to detect which of the ports receives the port detection signal.

13. The NE of claim 4 wherein the network element is responsive to the detection of the port detection signal by storing the port binding information.

14. The NE of claim 4 wherein the network element is responsive to the detection of the port detection signal by transmitting the port binding information to an associated leader NE.

15. A heterogenous telecommunications system comprising:
    a plurality of circuit switching network elements; and
    a plurality of packet switching network elements, each of the network elements inlcuding:
    a port for connection to another network element, the port configured to support at least one transport level overhead message;
    means for determining whether the network element is a leader or non-leader NE; and

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an out of band channel for communication with one or more network elements, the out of band channel configured to transmit a request for port identification and to receive a request for port identification, the port further configured to transmit a port detection signal in cooperation with the request for port identification transmitted through the out of band channel.

16. The system of claim 15 wherein each out of band channel is configured to transmit the request for port identification to another NE if the NE is not a leader NE.

17. The system of claim 15 wherein each NE further comprises a port identification request queue and each NE is configured to place a request for port identification in the queue.

18. The system of claim 17 wherein each NE is configured, if it is a leader NE, to accept port identification requests from other NEs and place them in the queue.

19. The system of claim 1 wherein the port detection signal is a SONET/SDH protection switching message.

20. The system of claim 1 wherein at least one of the NEs comprises a plurality of SONET/SDH ports and is responsive to the reception of a port detection signal by polling a plurality of ports to detect which of the ports receives the port detection signal.

21. The system of claim 20 wherein an NE is responsive to the detection of the port detection signal by storing the port binding information.

22. The system of claim 20 wherein the NE is responsive to the detection of the port detection signal by transmitting the port binding information to an associated leader NE.

23. In a heterogenous telecommunications system that includes a plurality of packet switching NEs and a plurality of circuit switching NEs a method for a network element to automatically determining port binding information for a link comprising the steps of;

A) each of the groups of circuit switching and packet switching network elements electing a leader;

B) an NE transmitting a request for port identification information through an out of band channel to a leader NE;

C) the leader NE transmitting the request to a second leader NE, the leader NE of the other group of NEs

D) the second leader NE transmitting the request to the connected NE from which the requesting NE wishes to obtain the port binding information; and

E) transmitting a port detection signal to the connected network element through the link.

24. The method of claim 23 wherein the port detection signal transmitted in step E) is a SONET/SDH protection switching message which includes the port identity of the originating port.

25. The method of claim 23 further comprising the step of:

F) a network element receiving a port detection request and monitoring its ports to detect the reception of a port detection signal in response.

26. The method of claim 25 wherein step F) comprises the step of:

F1) the network element polling all its idle ports to detect a status change at the port which receives the port detection message.

27. The method of claim 25 further comprising the step of:

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G) the network element storing the port binding information in response to the detection of the port detection signal.

28. The method of claim 25 further comprising the step of:

H) the network element transmitting the port binding information to its corresponding network element leader in response to the detection of the port detection signal.